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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/823,674	04/14/2004	Sung-hee Lee	102-1024	4894

38209 7590 12/22/2010

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EXAMINER	
RICE, ELISA M	
ART UNIT	PAPER NUMBER
2624	

MAIL DATE	DELIVERY MODE
12/22/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/823,674	LEE ET AL.	
	Examiner	Art Unit	
	ELISA M. RICE	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 October 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18 and 21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-16* is/are allowed.

6)☒ Claim(s) *17,18 and 21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10/29/2010 has been entered.

Response to Arguments

Applicant's arguments with respect to independent claims 17 have been considered. However, despite the newly added limitation which makes it more similar to previously allowed claims, this claim still lacks the detail necessary to make it allowable. In particular, as was also discussed in the advisory action, there is no indication in the claims as to how selecting of the discontinuous areas including comparing a deviation between motion vectors of a current block and peripheral block are related to the outputting of a final interpolation pixel. The previously allowed claims make the connection between these two limitations. Examiner suggests that Applicant include language similar to that seen in the previously allowed independent claims that relates these two limitations. Applicant states that there is no mention of first and second

interpolation pixels and that there is no weighting according to relative locations. Choi discloses a first and second interpolation pixel and this is addressed in the current Office Action as discussed below. The weighting according to relative locations can be found in the Heising reference at lines 15 to 21 of the left column, lines 29 to 34 and lines 35 to 36 of the right column in page 95, lines 12 to 18 of the right column in page 99, the first paragraph of the left column in page 100, Figure 2a, and formula 3 and 4. While Choi teaches use OBMC, Heising explicitly discloses that the OBMC is used selectively depending on the detected continuity of the blocks, thus avoiding the problem of blurring. The Choi and Heising reference are both in the same field of endeavor of block-based motion compensation systems and solve the same technical problem of artifact reduction. As discussed in the last paragraph of page 100 of the Heising reference, "switching between image warping model and the overlapped block motion compensation allows to deal efficiently with the problem of motion discontinuities.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 17, 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Choi and Heising.

Regarding claims 17 and 18,

Choi discloses a block-based motion compensation apparatus comprising:: a first motion compensation interpolator to read a first and a second pixel corresponding to a motion vector of an estimated current block respectively from a current and a previous frame or field inputted, and to calculate a first interpolation pixel; at least one second motion compensation interpolator to read a third and a fourth pixel corresponding to a motion vector estimated with respect to each of at least one peripheral block adjacent to the current block to be interpolated respectively from the inputted current and previous frame or fields(Choi, page 606, left column, lines 8-16; equation 10), and to calculate a second interpolation pixel; a candidate interpolation pixel calculator to calculate a candidate interpolation pixel by allocating a predetermined weight to the first and the second interpolation pixels (Choi, equation 12 wherein the weight is 0.5); and a final interpolation pixel selector to select one among the first interpolation pixel and the candidate interpolation pixel as a final interpolation pixel, and to output the selected final interpolation pixel (Choi, page 606, paragraph 1 on the right-hand side; equation 11-13; Fig. 7; Choi, refer to lines 8 to 16 and formula 10 in the left column of page 606, the first paragraph and formulae 11 to 13 in the right column of the same page, and Figure 7).

Choi does not disclose a candidate interpolation pixel calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the second pixels are to be interpolated, and further comprising a motion analyzer, the final interpolation pixel selector selects a final interpolation pixel according to the output result of the motion analyzer and wherein the selecting of the discontinuous areas includes comparing a deviation between motion vectors of a current block and peripheral blocks.

However, Heising a candidate interpolation pixel calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the second pixels are to be interpolated, and further comprising a motion analyzer, the final interpolation pixel selector selects a final interpolation pixel according to the output result of the motion analyzer (Heising, refer to lines 15 to 21 of the left column, lines 29 to 34 and lines 35 to 36 of the right column in page 95, lines 12 to 18 of the right column in page 99, the first paragraph of the left column in page 100, Figure 2a, and formula 3 and 4) and wherein the selecting of the discontinuous areas includes comparing a deviation between motion vectors of a current block and peripheral blocks (Heising, see formula 4; Heising, page 95, lines 29-37 on the right-hand side).

Choi and Heising are both in the same field of endeavor of motion compensation systems. It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the invention of Choi to include a candidate interpolation pixel

calculator to allocate a weight to the first and the second pixels according to relative locations where the first and the second pixels are to be interpolated, and further comprising a motion analyzer, the final interpolation pixel selector selects a final interpolation pixel according to the output result of the motion analyzer and wherein the selecting of the discontinuous areas includes comparing a deviation between motion vectors of a current block and peripheral blocks as taught by Heising because, as is well known to a practitioner or ordinary skill in the art, the above features perform identical functions in Choi for solving the artifact reduction problem ("significantly improving coding efficiency as well as visual quality", Heising, page 93, first paragraph).

Regarding claim 21, the combination of Choi and Heising discloses the method of claim 17, further comprising selectively applying the overlap block motion compensation to non-selected areas of the image blocks to reduce blurring (Heising, lines 29 to 37 of the right column in page 95 and formula 4, page 96, paragraph 3 on the right-hand side).

Claims 1-16 are allowable. Regarding claim 1, the claim recites a block-based motion compensation apparatus comprising "a final interpolation pixel selector to select one among the first interpolation pixel and the candidate interpolation pixel as a final interpolation pixel according to the result determined at the motion analyzer by comparing a deviation of the motion vectors of the current and the peripheral blocks,

and to output the selected final interpolation pixel." While the combination of Choi and Heising, previously used to reject the claims, discloses the other claimed limitations, the combination fails to provide for the prior quoted limitations. The Examiner has not found any other prior art to anticipate or render obvious the quoted claim limitations when read in light of the other claimed limitation. Accordingly, claim 1 is found to be allowable. Claims 2-8 depend upon claim 1 and are thus similarly found to be allowable. Claims 9, containing essentially all of the limitations as claim 1, is also found to be allowable, and likewise, dependent claims 10-16, containing all of the features of claim 9 are also found to be allowable.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ELISA M. RICE whose telephone number is (571)270-1582. The examiner can normally be reached on 12:00-8:30p.m. EST Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vikkram Bali can be reached on (571)272-7415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Elisa M Rice/
Examiner, Art Unit 2624

/VIKKRAM BALI/

Supervisory Patent Examiner, Art Unit 2624